

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>101678/VRD</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/EP 00/ 02860</b>	International filing date (day/month/year) <b>30/03/2000</b>	(Earliest) Priority Date (day/month/year) <b>06/04/1999</b>
Applicant <b>NOKIA NETWORKS OY</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2

☐ None of the figures.

**THIS PAGE BLANK (USPTO)**

## INTERNATIONAL SEARCH REPORT

International Application No

EP 00/02860

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 H04Q7/38 H04M3/56

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	J. WANG ET AL.: "Wireless Voice-over -IP and Implications for Third-generation Network Design" BELL LABS TECHNICAL JOURNAL, 1 July 1998 (1998-07-01) - 1 September 1998 (1998-09-01), pages 79-97, XP000782375 NJ, USA page 79, line 1 -page 84, line 34; figures ---	1,2,7,8
Y	G. THOM: "H.323: The Multimedia Communications Standard for Local Area Networks" IEEE COMMUNICATIONS MAGAZINE, 1 December 1996 (1996-12-01), pages 52-56, XP000636454 NY, USA * see complete article * ---	1,2,7,8

-/--



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 July 2000

Date of mailing of the international search report

01/08/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Geoghegan, C

**THIS PAGE BLANK (USPTO)**

## INTERNATIONAL SEARCH REPORT

International Application No

/EP 00/02860

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	A. CATCHPOLE: "Voice-Data Convergence and the Corporate Voice-over-IP Trial" BRITISH TELECOMMUNICATIONS ENGINEERING, vol. 17, 1 January 1999 (1999-01-01), pages 218-224, XP000801951 UK * see complete article * ----	1,2,7,8
A	W0 98 17048 A (BT) 23 April 1998 (1998-04-23) page 4, line 1 -page 11, line 30; figures ----	1,2,7,8
A	W0 98 59467 A (ERICSSON) 30 December 1998 (1998-12-30) page 3, line 1 -page 9, line 23; figures -----	1,2,7,8

**THIS PAGE BLANK (USPTO)**

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/02860

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
W0 9817048	A	23-04-1998	AU	4630597 A	11-05-1998
			EP	0932972 A	04-08-1999
W0 9859467	A	30-12-1998	AU	7949998 A	04-01-1999
			SE	9702384 A	24-12-1998

**THIS PAGE BLANK (USPTO)**

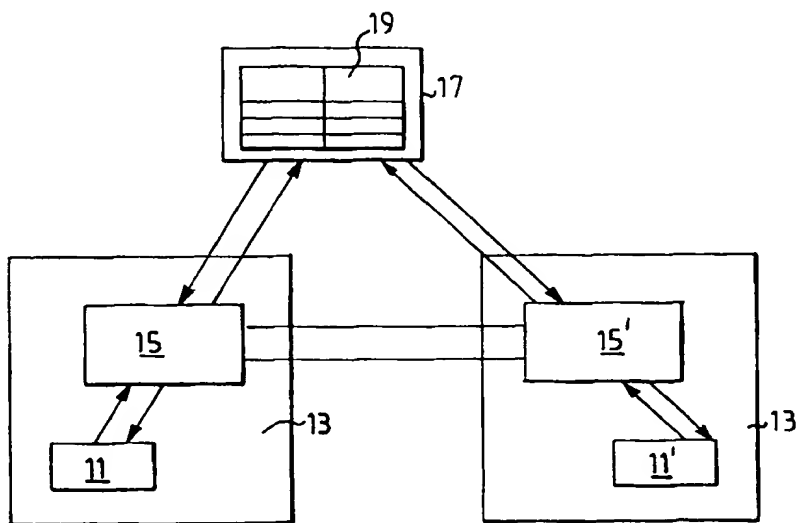




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>H04L 12/46</b>		<b>A2</b>	(11) International Publication Number: <b>WO 98/59467</b>
			(43) International Publication Date: 30 December 1998 (30.12.98)
(21) International Application Number: PCT/SE98/01204 (22) International Filing Date: 22 June 1998 (22.06.98) (30) Priority Data: 9702384-0 23 June 1997 (23.06.97) SE (71) Applicants (for all designated States except US): TELEFON- AKTIEBOLAGET LM ERICSSON (publ) [SE/SE]; S-126 25 Stockholm (SE). TELIA AB [SE/SE]; S-123 86 Farsta (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): KANTER, Theo [NL/SE]; Rönninge Skolväg 35E, S-144 62 Rönninge (SE). RYDE, Anders [DK/SE]; Kyrkvägen 21, S-133 34 Saltsjöbaden (SE). FRISK, Claes [SE/SE]; Bläcksvampsvägen 89, S-141 60 Huddinge (SE). SVENNEVIK, Anders, Christian [SE/SE]; Dalagatan 231 ö.g., S-113 24 Stockholm (SE). (74) Agents: HERBJØRNSSEN, Rut et al.; Albihns Patentbyrå Stockholm AB, P.O. Box 3137, S-103 62 Stockholm (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>Without international search report and to be republished          upon receipt of that report.</i>	

(54) Title: METHOD AND DEVICE FOR ESTABLISHING CONNECTIONS BETWEEN TWO SUBSCRIBERS IN TWO DIFFERENT SUBNETWORKS



## (57) Abstract

The present invention relates to a method and an apparatus for establishing connections between two subscribers in an Internet Protocol (IP) based network, said network being divided into zones, or subnetworks, each zone being managed by a gatekeeper (15, 15', 25, 25'). All gatekeepers are connected to a zone management means (17; 27), which holds information about the logical addresses of all user terminals (11, 11'). A first user (11) in a first zone (13) managed by a first gatekeeper, who wishes to establish a connection to another user (11') in another zone (13') managed by a second gatekeeper (15') sends a request to the first gatekeeper (15), from which the request is forwarded to the zone management means (17). The zone management means (17) requests the address from the second gatekeeper (15') and returns an address confirmation, so that the connection may be set up.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Larvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

METHOD AND DEVICE FOR ESTABLISHING CONNECTIONS BETWEEN TWO SUBSCRIBERS IN TWO DIFFERENT SUBNETWORKS

**Technical Field**

The present invention relates to the communication between terminals in Internet  
5 Protocol (IP) based networks.

**Background**

The Internet is being used to an increasing degree for commercial communication. In particular there is a demand for real-time applications for voice, image and data in  
10 decentralized corporate data networks.

With present technology, companies may connect several Intranets and remote users in an Internet Virtual Private Network (I-VPN).

A Virtual Private Network (VPN) may comprise a number of zones, or subnetworks.  
15 For example each department in a company may have its own zone, all zones being connected to one large network. Each zone has its own gatekeeper, which holds information about all addresses in its own zone.

There are known solutions for letting end users in a network communicate by means  
20 of a gatekeeper within a zone or via a location service, but direct communication between the different gatekeepers is not handled today.

**Summary of the Invention**

It is an object of the present invention to provide a Virtual Private Network (VPN)  
25 with internal zones, in which direct communication between the different zones is enabled.

It is another object of the invention to enable the roaming between different zones in a VPN.

These objects are achieved according to the invention by a zone management means, which is connected to the gatekeepers of all the zones in the VPI.

The zone management means holds information about all addresses found in  
5 gatekeepers in the VPN and assists in the address resolution within a VPN.

The solution according to the invention offers the following advantages:

- Roaming in the network is supported, that is, users are enabled to move between different terminals and different zones in the network.
- 10 - A private network for audio, video and/or data communication is created, which comprises internal zones and which can cooperate with external clients and location services.
- The network according to the invention promotes distribution of functionality with respect to TCP/IP.

15

### **Brief Description of the Drawings**

Figure 1 shows a connection between two end users in a zone, assisted by a gatekeeper, according to prior art;

Figure 2 shows a connection between two end users in different zones, assisted by  
20 gatekeepers and a zone management means, according to the invention;

Figure 3 shows the signalling that takes place when a connection between two end users in different zones is set up, according to the invention;

Figures 4A and 4B show the signalling that takes place when a new gatekeeper is to be registered and unregistered, respectively, with the zone management means;

25 Figures 5A and 5B show the signalling that takes place when a new endpoint is to be registered, respectively, with the zone management means; and

Figure 6 illustrates the principles for roaming in the network according to the invention.

### Detailed Description of Embodiments

Figure 1 is a schematic drawing of a connection between two end users 1 in a zone 3 of a private network, assisted by a gatekeeper 5, as common in the art. The gatekeeper 5 holds information about the location of all addresses belonging to its zone, and also sets up connections within the zone.

The solution according to the invention may be implemented in any kind of data network. For simplicity, a protocol known as H.323, which is a de facto standard in audio, video and/or data communication, will be used as a basis for the discussion.

10

Figure 2 is a schematic drawing of a network according to the invention. The network is divided into different zones 13, 13', each zone comprising a gatekeeper 15, 16'. Each end user 11, 11' is connected the gatekeeper 15, 15' of the zone 13, 13' to which it belongs. All gatekeepers are connected to one zone management means 17, according to the invention. The zone management means 17 comprises a table 19 of the logical addresses, or alias addresses, of all registered end points in all zones of the network, and the zone in which each end point is registered.

An end user 11 who wishes to establish a connection to another end user 11' in a different zone, initiates this by signalling to the gatekeeper 15. The gatekeeper 15 requests the destination from the zone management means 15. The zone management means 17 informs the gatekeeper 15 of the physical location of the end user 11' to which the connection is to be set up. The signalling between the gatekeepers 15, 15' of the two networks then proceeds in the way common in the art.

25

If the H.323 protocol is used, the signalling that takes place will be as shown in more detail in Figures 3, 4A, 4B, 5A and 5B.

Figure 3 shows the signalling that takes place when an end user 11 in one zone 13 wishes to set up a connection to another end user 11' in a different zone 13'.

30

The end user 11 who wants to set up a connection to another end user 11', sends an Address Request (ARQ) signal to its gatekeeper 15. The ARQ signal comprises the following:

- the destination alias address (the address of the receiving end user 11')
- 5 - the Destination Call Signalling Address (normally the address of the receiving end user 11')
- the Source Alias Address (the address of the end user 11 initiating the connection)
- the Source Call Signalling Address (normally the address of the end user 11 initiating the connection)
- 10 - the desired bandwidth
- The desired Call Model

The gatekeeper 15 sends a Zone Request (Zone RQ) signal comprising the Destination Alias Address of the receiving end user 11' to the zone management  
15 means 17.

The zone management means 17 responds by sending a Zone Confirmation (Zone CF) signal to the gatekeeper 15, comprising the message DestinationOkWellKnownRasAddress, which indicates that the address has been  
20 located. (RAS Address = Registration Admission and Status Address)

The gatekeeper 15 can then send a Location Request (Location RQ) signal to the gatekeeper 15' of the zone to which the receiving end user 11' belongs.

25 The gatekeeper 15' responds by sending a Location Confirmation (Location CF) signal to the gatekeeper 15, comprising the Destination Call Signalling Address

The gatekeeper 15 responds to the end user 11 with an Address Confirmation (ACF) signal comprising the following information:

- 30 - the bandwidth available/allocated

- the call model to be used
- the destination call signalling address

The end user 11 then sends a Setup signal to the gatekeeper 15 comprising the  
5 following information

- bearer capability
- user to user information

The gatekeeper forwards the information in the setup signal to the receiving end user  
10 11'.

The receiving end user 11' sends an Address Request (ARQ) signal to its gatekeeper  
15', comprising the following information:

- the destination alias address
- 15 - the Destination Call Signalling Address
- the Source Alias Address
- the Source Call Signalling Address
- the desired bandwidth
- The desired Call Model

20

The gatekeeper 15' responds by sending an Address Confirmation (ACF) signal to  
the end user 11', comprising the following information

- Bandwidth
- Call Model
- 25 - Destination Call Signalling Address

The receiving end user 11' then sends a Connect signal to the gatekeeper 15 in the  
zone of the sending end user 11, comprising the following information:

- Transport Address H.245 Control Channel
- 30 - Destination endpoint Type

The gatekeeper 15 forwards the Connect signal to the end user 11.

Figure 4A shows the signalling that takes place between a gatekeeper 15, 15' and a zone management means 17 when a new gatekeeper is to be registered with the zone management means 17, if the H.323 protocol is used. The gatekeeper 15, 15' sends a Gatekeeper Registration Request, GK\_RRQ, comprising the GatekeeperWellKnownRasAddress, which is the address by which the Gatekeeper 15, 15' is known in the network, to the zone management means 17. The zone management means 17 responds with a Gatekeeper Registration Confirmation, GK\_RCF, signal comprising the ZoneIdentifier, which is the identification to be used for the zone of the new gatekeeper, to confirm that the gatekeeper has been registered as a gatekeeper for this zone.

Figure 4B shows the signalling that takes place between a gatekeeper 15 and a zone management means 17 when an existing gatekeeper 15 is to be unregistered, that is deleted from the domain of the zone management means 17. Again the H.323 protocol is assumed. The gatekeeper 15 sends a Gatekeeper Unregistration Request, GK\_URQ, to the zone management means 17, comprising the ZoneIdentifier. The zone management means 17 responds by sending a Gatekeeper Unregistration Confirmation, GK\_UCF, signal back to the gatekeeper 15, comprising the NumberOfEndPointsUnregistered, which indicates how many end points are connected to the gatekeeper 15 that has been unregistered. The GK\_UCF signal confirms that the gatekeeper 15, is no longer registered with the zone management means 17.

Figure 5A shows the signalling that takes place between and endpoint, that is a user terminal 11, and a gatekeeper 15, and between a gatekeeper 15 and a zone management means 17, when a new endpoint 11 is to be registered, according to H.323 protocol. First the new endpoint 11 sends a Registration Request, RRQ, signal to its gatekeeper 15, comprising the following:



- CallSignallingAddress - The address of the gatekeeper 15
  - RAS\_Address - Registration Admission and Status Address
  - TerminalType - The type of terminal connected at the end point 11
  - AliasAddress - The address by which the new end point 11 will be known in the
- 5 network

The gatekeeper 15 sends an End Point Registration Request, EP\_RRQ, signal to the zone management means 17, comprising the following:

- EndPointIdentifier - identifying the new end point 11
  - 10 - ZoneIdentifier - identifying the zone in which the new end point is found
  - AliasAddress - the address by which the new end point will be known in the
- network

The zone management means 17 responds to the gatekeeper 15 by sending an End  
15 Point Registration Confirmation, EP\_RCF, signal, comprising the AliasAddress of the new end point 11.

The gatekeeper 15 then responds to the new end point 11 with a Registration Confirmation, RCF, signal comprising the following:

- GK\_CallSignalAddress - the address of the gatekeeper
- 20 - EndPointIdentifier - the identifier of the new end point 11

The new end point 11 has now been registered with the gatekeeper 15 and the zone management means 17.

Figure 5B shows the signalling that takes place when an existing endpoint 11 is to be  
25 unregistered, that is, now longer to be connected to the gatekeeper 15.

First the new endpoint 11 sends a Unregistration Request, URQ, signal to its gatekeeper 15, comprising the following:

- CallSignallingAddress - the address of the gatekeeper 15
- EndPointIdentifier - the identifier of the end point 11 to be unregistered
- 30 - AliasAddress - the address by which the end point 11 is known in the network

The gatekeeper 15 sends an End Point Unregistration Request, EP\_URQ, signal to the zone management means 17, comprising the following:

- EndPointIdentifier - identifying the new end point 11
- 5 - ZoneIdentifier - identifying the zone 13 in which the new end point 11 is found
- AliasAddress - the address by which the end point 11 is known in the network

The zone management means 17 responds to the gatekeeper 15 by sending an End Point Unregistration Confirmation, EP\_UCF, signal, comprising the AliasAddress of  
10 the end point 11.

The gatekeeper 15 then responds to the new end point 11 with an Unregistration Confirmation, UCF, signal.

The new end point 11 has now been unregistered from the gatekeeper 15 and the zone management means 17.

15

Figure 6 illustrates the principles for roaming in the network according to the invention, that is, for a person or a terminal to move between zones. A number of end points, 21a, 21b, 21c in a first zone 23 are connected to a first gatekeeper 25. Other end points 21d, 21e in a second zone 13' are connected to a second gatekeeper  
20 25'. Both gatekeepers 25, 25' are connected to a zone management means 27.

Each gatekeeper 25, 25' is also connected to a database means 29 and 29' respectively. The database means 29, 29' comprise records of information about the services assigned to each end point 21a,... 21e in the zone 23, 23' to which the  
25 database means 29, 29' belongs. Examples of services may be a wake-up call, or the supplementary services as specified in the H.323, such as call redirection. The services are executed in execution means 31 and 31' respectively.

For roaming to be possible, the logical addresses of all end points or users 21a,...21e -  
30 must be unique in the whole network. The most convenient way of assuring this is to include the name of the zone to which the user belongs in the name. In this example

this would mean that a user 21a in the first zone 23 would be identified by its number (or logical name) together with the number (or logical name) of the zone, for example 23.21a or another well-defined format. The user might keep this name even when he moved to another zone, or the zone name might be changed.

5

A user 21a who wishes to move from one zone 23 to another 23', registers with the gatekeeper 25' in the new zone 23'. The gatekeeper 25' then informs the zone management means 27 that the subscriber is now found in the zone 23' of this gatekeeper 25'. The signalling is performed according to Figure 5A. In one embodiment of the invention, the user 21a must disconnect from the first gatekeeper 25, as shown in Figure 5B, before connecting to the new gatekeeper 25'. In another embodiment the zone management means automatically deletes the user 21a from the first gatekeeper 25.

10

15

The services assigned to the user 21a are stored in the database means 29 connected to the first gatekeeper 25. When the user 21a moves to a different zone, the service records belonging to that user 21a may be moved to the database means 29' connected to the new gatekeeper 25'. When a service is activated, it will then be executed in the execution means 31' of this zone 23'. It would also be possible to keep the service records in the first database 29. In that case, the execution of the service would be carried out in the execution means 31 of the first zone 23.

20

Moving within one zone may be done in the same way, except that no changes are needed to the services.

CLAIMS

1. An apparatus (17) for enabling connections between a transmitting (11) and a receiving (11') user terminal, each one of said terminals (11, 11') being located in an audio, video and/or data communication network, said networks forming zones (13, 13') in a larger data communication network, each zone (13, 13') being managed by a gatekeeper (15, 15'), said apparatus being connected to the gatekeepers of at least two zones (13, 13') in the network,  
5 **characterized** in that it comprises:
- 10 - connections to the gatekeepers (15, 15') of all zones (13, 13') in the network
  - information about the logical addresses of user terminals (11, 11') found in the different zones (13, 13').
2. An apparatus according to claim 1, **characterized** in that a subscriber connected to one gatekeeper (15) may register temporarily with another gatekeeper (15').
3. An apparatus according to claim 1 or 2, **characterized** in that it is adapted for H.323 protocol signalling.
4. A method for establishing a connection between a sending user terminal (11) and a receiving user terminal (11') each one of said terminals (11, 11') being located in an audio, video and/or data communication network, said networks forming zones (13, 13') of a larger data communication network, each zone (13, 13') being managed by a gatekeeper (15, 15')  
20 **characterized** by the following steps:
- 25 - Sending a signal from a first user terminal (11) in a first zone (13) to the gatekeeper (15) of that zone (13), requesting an address for a second user terminal (11') in a second zone (13');

- Requesting information about the second zone (13') in which the second user terminal (11') is found, and the gatekeeper (15') of this zone (13'), from an apparatus (17) comprising information about all user terminals (11, 11');
- Locating the second user terminal (11') in the second zone (13');
- 5 - Disconnecting the connection to the zone management means (17);
- Establishing the connection between the first (11) and the second (11') user terminal.

10 5. A method according to claim 4, **characterized** in that the signal sent from the first user terminal is an address request signal according to H.323 protocol.

6. A method according to claim 4 or 5, **characterized** in that the identification of the second zone (13') is carried out in the following steps:

- 15 - Sending a zone request signal from the gatekeeper (15) to the zone management means (17);
- Sending a location request signal from the zone management means (17) to the gatekeeper (15') in the zone of the receiving user terminal (11');
- Sending a location confirmation signal from the gatekeeper (15') to the zone management means (17);
- 20 - Sending an address confirmation signal from the zone management means (17) to the gatekeeper (15).

25 7. A method according to any one of claims 4, 5 or 6, **characterized** in that the second user terminal (11') in the second zone (13') is located, and the connection between the first (11) and the second (11') user terminal is set up, in the following steps:

- Sending a setup signal from the sending end user (11) to the gatekeeper (15), specifying the bearer capability;
- Sending the information in the setup signal from the gatekeeper (15) to the receiving end user (11');
- 30

- Sending an address request signal from the receiving end user (11') to its gatekeeper (15');
  - Sending an address confirmation signal from the gatekeeper (15') to the end user (11') ;
  - 5 - Sending a connect signal from the receiving end user (11') to the gatekeeper of the sending end user (11);
  - Forwarding the connect signal from the gatekeeper (15) to the sending end user (11');
- 10 8. A network for audio, video and/or data communication **characterized** in that it comprises a number of subnetworks, or zones (13, 13'), each zone managed by a gatekeeper (15, 15'), and all gatekeepers connected to a zone management means (17) according to any one of claims 1-3.

15

1 / 5

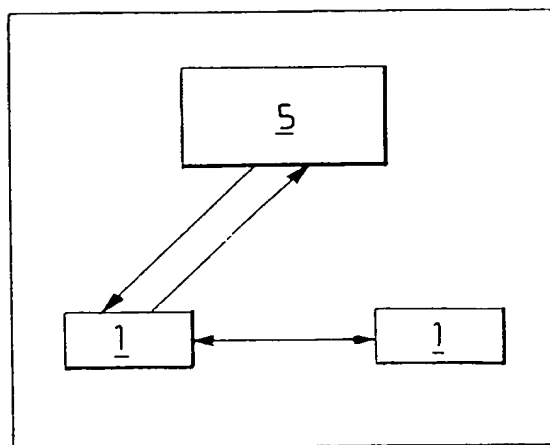


FIG. 1

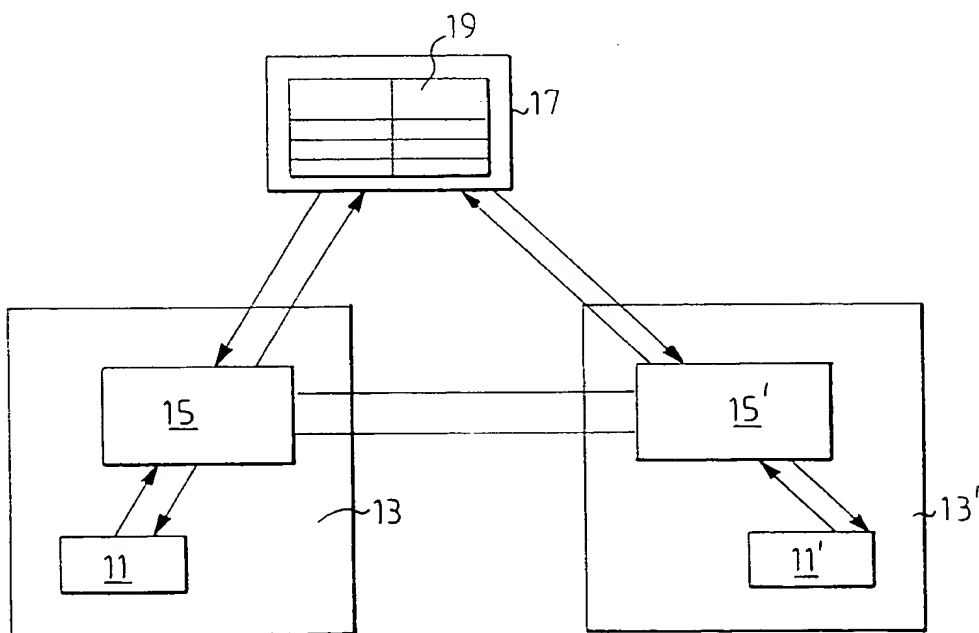
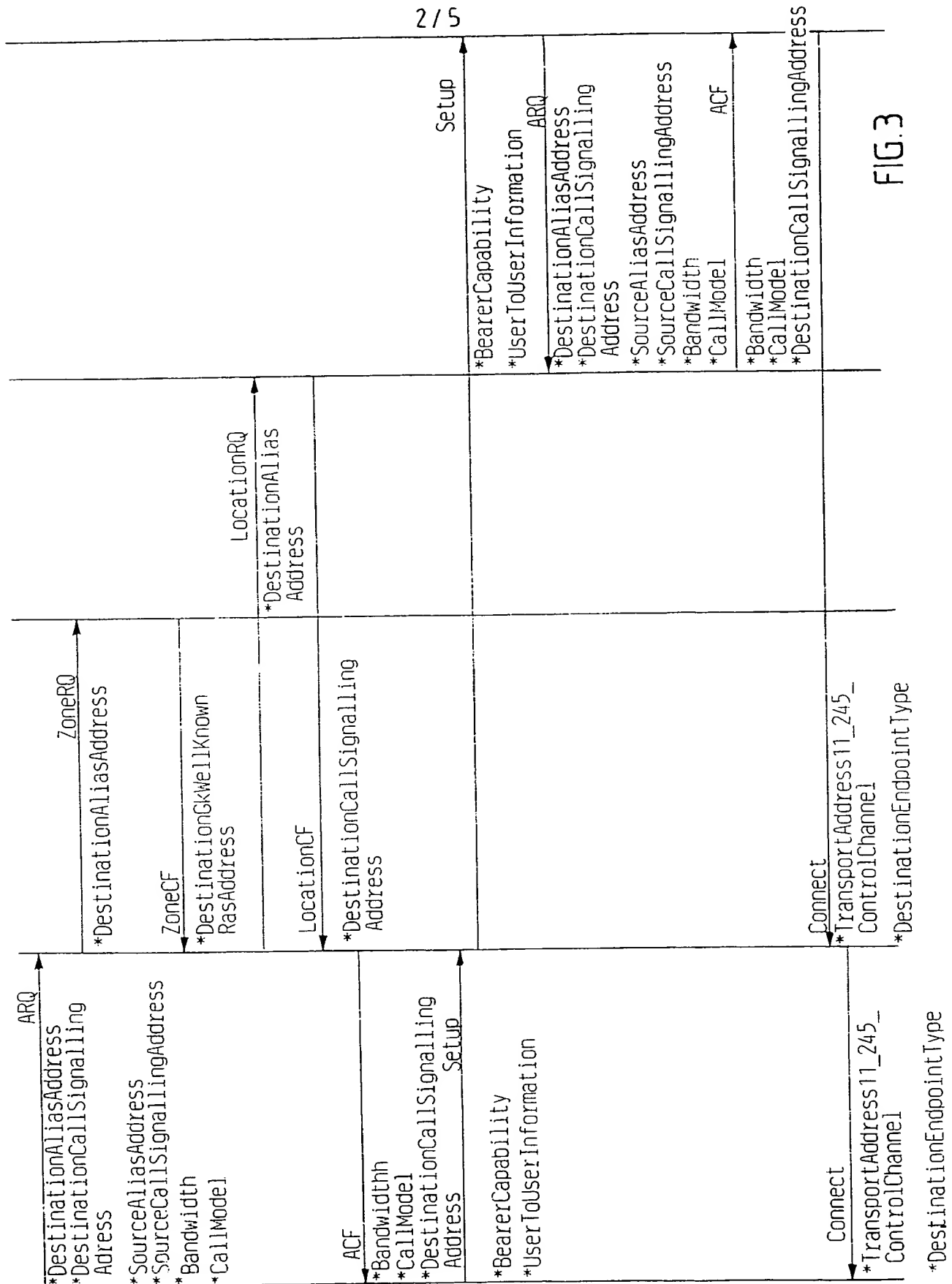


FIG. 2





3 / 5

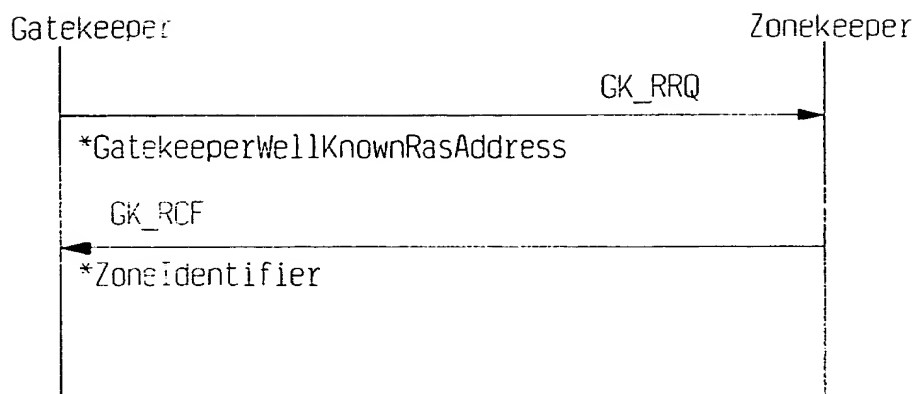


FIG. 4A

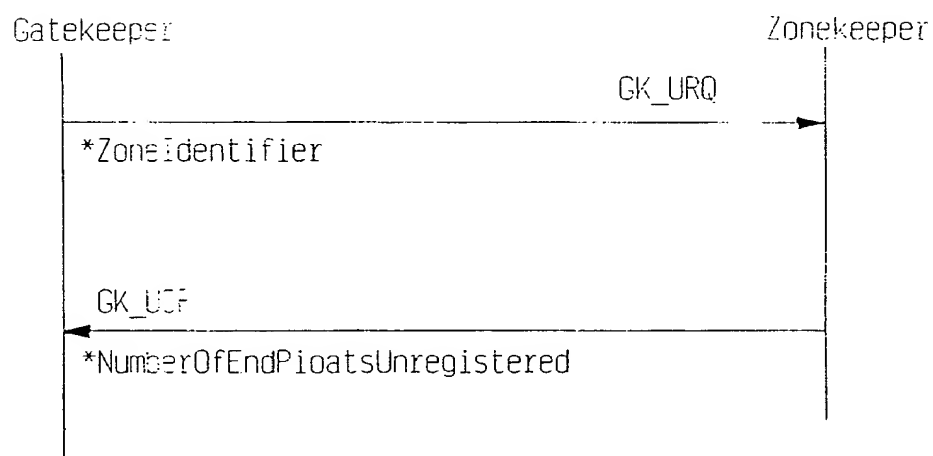


FIG. 4B

4/5

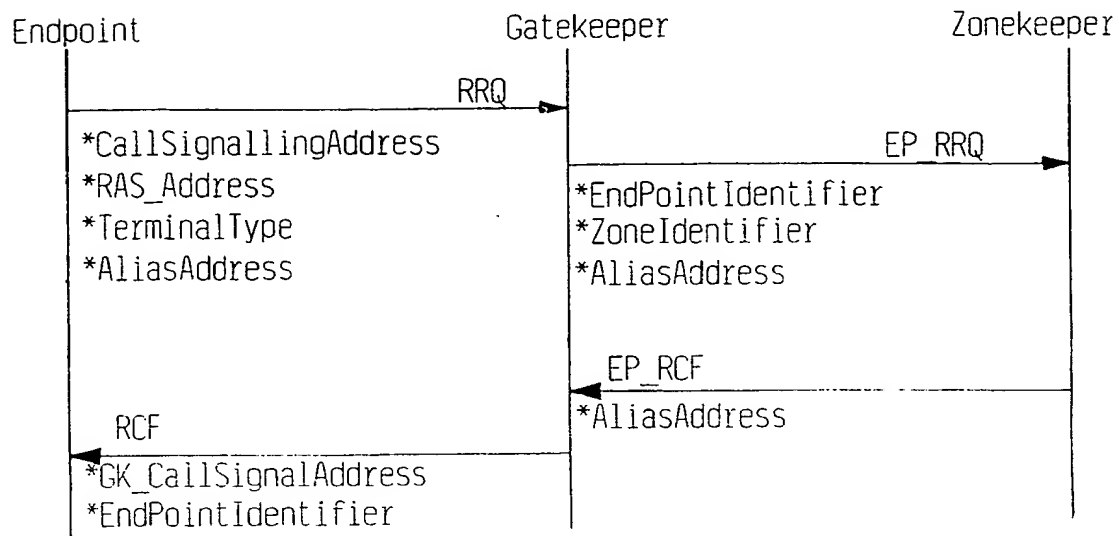


FIG.5A

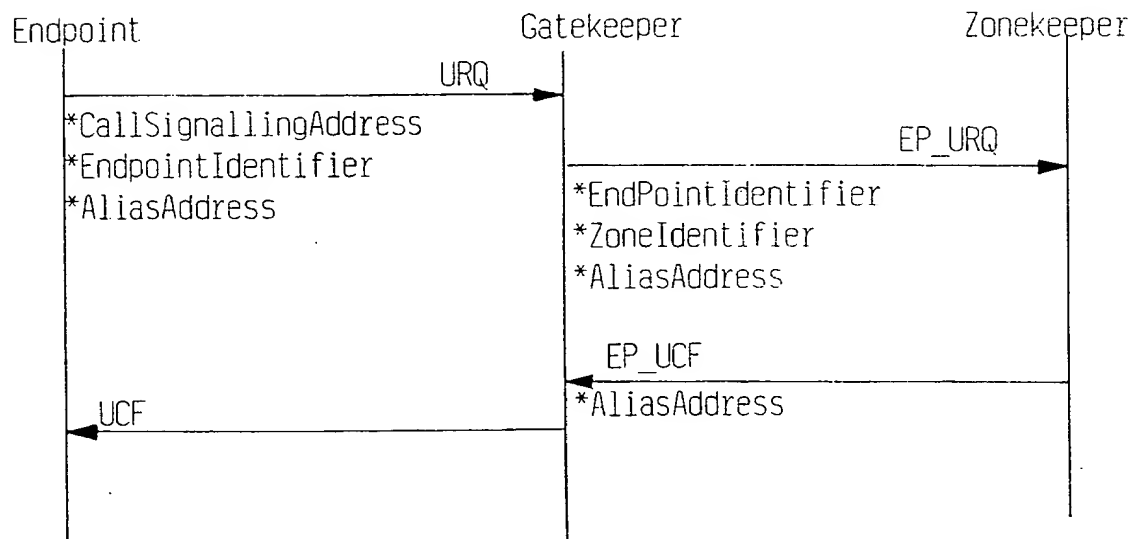


FIG.5B

5/5

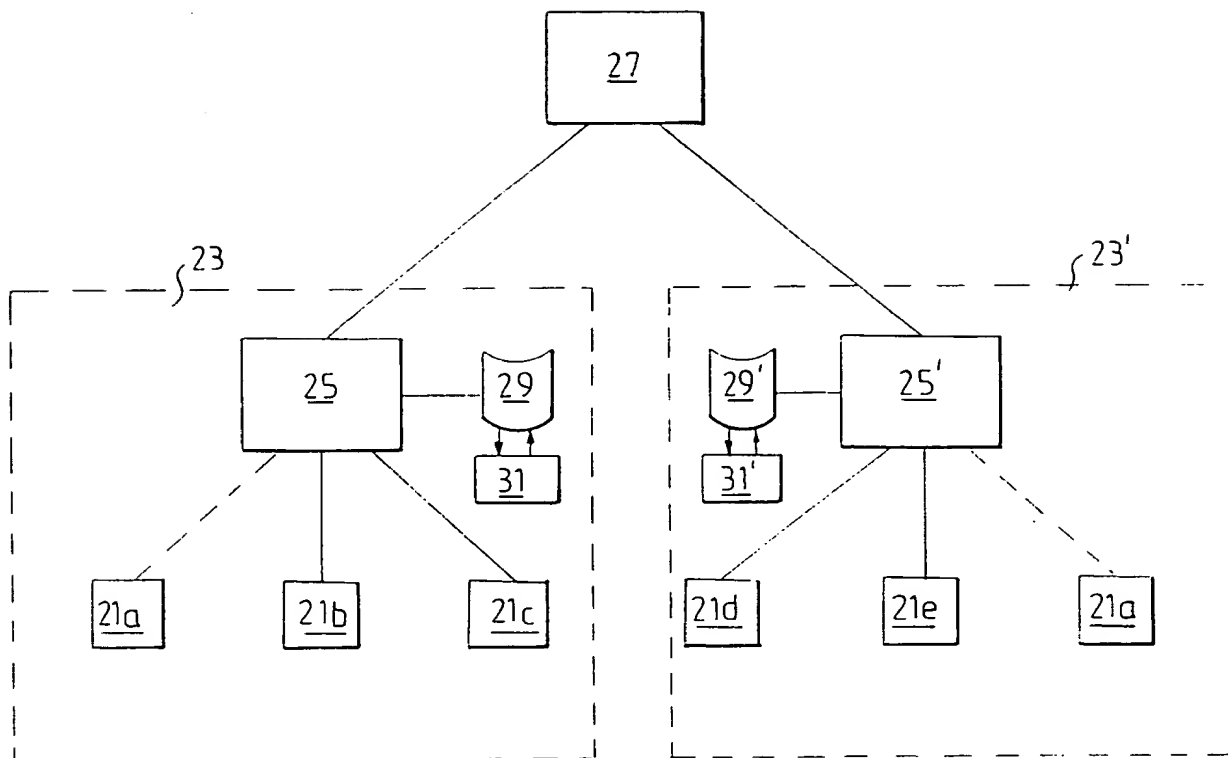


FIG. 6

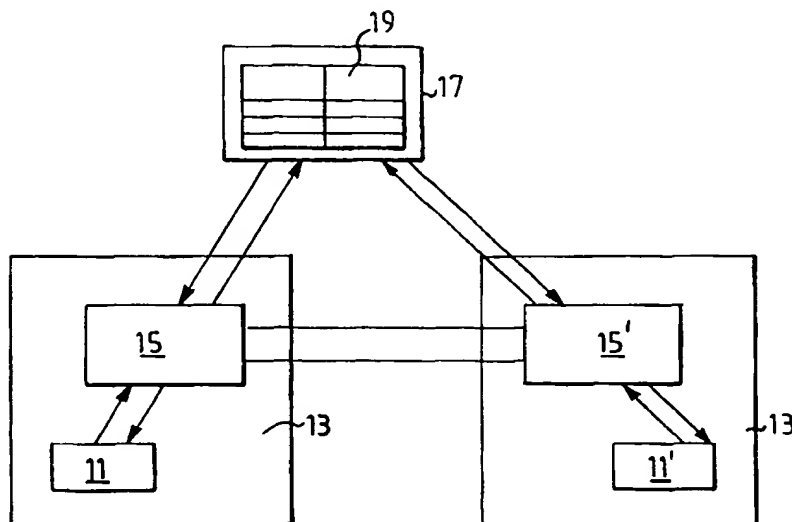
**THIS PAGE BLANK (USPTO)**



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>H04L 12/46, 12/56</b>		A3	(11) International Publication Number: <b>WO 98/59467</b>
			(43) International Publication Date: 30 December 1998 (30.12.98)
(21) International Application Number: PCT/SE98/01204 (22) International Filing Date: 22 June 1998 (22.06.98) (30) Priority Data: 9702384-0 23 June 1997 (23.06.97) SE (71) Applicants (for all designated States except US): TELEFON- AKTIEBOLAGET LM ERICSSON (publ) [SE/SE]; S-126 25 Stockholm (SE). TELIA AB [SE/SE]; S-123 86 Farsta (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): KANTER, Theo [NL/SE]; Rönninge Skolväg 35E, S-144 62 Rönninge (SE). RYDE, Anders [DK/SE]; Kyrkvägen 21, S-133 34 Saltsjöbaden (SE). FRISK, Claes [SE/SE]; Bläcksvampsvägen 89, S-141 60 Huddinge (SE). SVENNEVIK, Anders, Christian [SE/SE]; Dalagatan 231 ö.g., S-113 24 Stockholm (SE). (74) Agents: HERBJØRNSSEN, Rut et al.; Albihns Patentbyrå Stockholm AB, P.O. Box 3137, S-103 62 Stockholm (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  Published With international search report. (88) Date of publication of the international search report: 1 April 1999 (01.04.99)	

(54) Title: METHOD AND DEVICE FOR ESTABLISHING CONNECTIONS BETWEEN TWO SUBSCRIBERS IN TWO DIFFERENT SUBNETWORKS



## (57) Abstract

The present invention relates to a method and an apparatus for establishing connections between two subscribers in an Internet Protocol (IP) based network, said network being divided into zones, or subnetworks, each zone being managed by a gatekeeper (15, 15'; 25, 25'). All gatekeepers are connected to a zone management means (17; 27), which holds information about the logical addresses of all user terminals (11, 11'). A first user (11) in a first zone (13) managed by a first gatekeeper, who wishes to establish a connection to another user (11') in another zone (13') managed by a second gatekeeper (15') sends a request to the first gatekeeper (15), from which the request is forwarded to the zone management means (17). The zone management means (17) requests the address from the second gatekeeper (15') and returns an address confirmation, so that the connection may be set up.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BF	Burkina Faso	GR	Greece		Republic of Macedonia	TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/01204

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04L 12/46, H04L 12/56

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0731582 A2 (AT&IPM), 11 Sept 1996 (11.09.96), page 3, line 10 - line 17; page 3, line 25 - line 32, figure 1	1,4,6-8
Y	--	2,3,5
Y	ITU-T Standard H. 323, 1996 paragraph 6.4	3,5
Y	JP 8331150 A0 (FUJITSU LTD), 13 December 1996 (13.12.96), abstract	2
	--	

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

20 January 1999

28 -01- 1999

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Christina Halldin  
Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/01204

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5398242 A (RADIA J. PERLMAN), 14 March 1995 (14.03.95), abstract --	1-8
A	JP 8181713 A (NEC CORP), 12 July 1996 (12.07.96), abstract --	3,5
A	US 5633866 A (ROSS W. CALLON), 27 May 1997 (27.05.97), abstract --	1-8
A	US 5437046 A (NORMAN T. BRIGHT ET AL), 25 July 1995 (25.07.95), abstract --	1-8
A	US 5537412 A (HISATO SHIMA ET AL), 16 July 1996 (16.07.96), abstract -- -----	1-8



# INTERNATIONAL SEARCH REPORT

Information on patent family members

01/12/98

International application No.

PCT/SE 98/01204

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
EP	0731582	A2	11/09/96	CA	2169493 A	11/09/96
				CN	1135689 A	13/11/96
				JP	9008838 A	10/01/97
				US	5600644 A	04/02/97
-----						
JP	8331150	AO	13/12/96	NONE		
-----						
US	5398242	A	14/03/95	NONE		
-----						
JP	8181713	A	12/07/96	JP	2748871 B	13/05/98
-----						
US	5633866	A	27/05/97	US	5699347 A	16/12/97
-----						
US	5437046	A	25/07/95	AU	678219 B	22/05/97
				AU	6272194 A	14/09/94
				EP	0637415 A	08/02/95
				JP	7507671 T	24/08/95
				WO	9419889 A	01/09/94
-----						
US	5537412	A	16/07/96	EP	0584940 A	02/03/94
				JP	6053965 A	25/02/94
-----						

Form PCT ISA/210 (patent family annex) (July 1992)

**THIS PAGE BLANK (USPTO)**